Space Weather Forecast

Issued on Sunday, 08 October 2023 at 01:17 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Chance of Moderate-class flares throughout.

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Solar Activity is Moderate with one Moderate class flare observed at 07/1807UTC from a newly emerged sunspot region in the southeast. There are seven sunspot regions on the visible disc. Nine sunspot regions feature on the visible disc. In the northwest the two largest regions are present. The more northern region has currently lost the delta spot in the intermediate region and the intermediate spots are showing some growth in recent hours. The more southern feature is rather smaller with little overall change observed. Near south centre disc a third region has shown minor growth recently in the trailing portion and the aforementioned newly emerged sunspot region in the southeast is growing rather quickly and is north-south magnetically aligned The remaining regions all appear to be small and mostly simple at present. Whilst there have been a couple of Coronal Mass Ejections (CMEs) assessed from the Sun in the last 24 hours, neither are expected to give significant impacts at Earth.

Solar Wind / Geomagnetic Activity: Solar winds have gradually declined from slightly elevated to Low levels. Total magnetic field strength has been weak. The north-south component varied weakly. Geomagnetic activity remained Quiet.

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) remained at background levels, with no solar radiation storms observed.

Four-Day Space Weather Forecast Summary

Solar Activity: Solar activity is expected to remain at Low to Moderate levels, with the greatest chance of a further Moderate level flare probably coming from the two larger regions in the northwest of the disc, and perhaps also from the newly emerging region in the southeast, which has the rather unusual magnetic structure which favours enhanced flare activity.

Solar Wind / Geomagnetic Activity: Solar winds are now at Low levels and expected to remain at these levels until the High Speed Streams (HSS) of two successive coronal holes arrive at Earth later on Day 2 (09 Oct) and into Day 3 (10 Oct), perhaps reaching elevated levels. Quiet to Unsettled geomagnetic activity is expected. There is chance of Active intervals, and these are most likely on Days 2 and 3, when there is a slight chance of a Minor storm period.

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) is most likely to remain at background levels, with a very low risk of enhancements from the current sunspots on the disc.

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Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	1	30	20	1
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	No	30	30	30	30
Very Active	R3 to R5 X	No	5	5	5	5

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	5	5	5	5
Very Active	≥ S3 *	No	1	1	1	1

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)

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